

Screw-worm Activities June 1956
Orlando, Florida

I. Mass rearing techniques

A. Larval Rearing

After growing for one day on standard medium approximately 24,000 screw-worm larvae were reared through on a medium containing only beef heart. For comparison 22,000 larvae were reared through on medium containing horse meat only. An average of 1.57 lbs. of horse meat was required to produce 1,000 larvae and 1.52 lbs. of trimmed beef heart produced 1,000 larvae. There was no difference in the size of full-grown larvae.

Small-scale tests indicated that ground beef spleen and pressed fish cake were unsatisfactory alone or in combination with meat as rearing media for screw-worm larvae. Media containing whole pork heart was better than whole beef heart and trimmed pork heart was as good as trimmed beef heart. Beef kidney alone in the rearing media was too gummy but appeared satisfactory when combined in equal portions with horse meat or beef hearts.

The initial trial run at the Bithlo Pilot Plant for producing a million flies per week was begun June 29. It is planned to try producing these flies on a five-day-week schedule but because of the enormous amount of work involved and limited personnel, this may not be possible, without considerable overtime on the part of employees. It is also

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After growing for one day on standard medium approximately 25,000 screw-worm larvae were reared through on a medium containing only beef heart. For comparison 25,000 larvae were reared through on medium containing horse meat only. An average of 1.57 lbs. of horse meat was required to produce 1,000 larvae and 1.52 lbs. of trimmed beef heart produced 1,000 larvae. There was no difference in the size of full-grown larvae.

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The initial trial run at the Hialeah Plant for producing a million flies per week was begun June 29. It is planned to try producing these flies on a five-day-week schedule but because of the enormous amount of work involved and limited personnel, this may not be possible without considerable overtime on the part of employees. It is also

planned to sterilize as many of the flies reared as possible. It is hoped that we can utilize these sterilized flies in field tests, but if this fails to materialize we expect to distribute the sterilized flies through County Agriculture Agents to cattlemen for distribution so that they can realize the benefits of any control that may result.

B. Nutrition of the Screw-worm Fly Related to Oviposition and Viability of Eggs

Several combinations of honey plus human plasma, Betaplexin (Vitamin B Complex), yeast extract, and whole fresh egg were compared with honey alone and the standard diet of honey-meat mixture replaced at three days with honey alone. All of the combinations were satisfactory although none was better than the standard diet. At 10 days 100 females from each cage were egged with the average number of eggs per female ranging from 216 for a honey plus 10% plasma diet to 262 for flies fed the standard diet. Flies fed honey alone averaged 234 eggs per female, but viability was 89% compared to 97% for the standard. Viability of eggs from flies fed other combinations ranged from 92% to 98%.

C. Optimum Number of Screw-worm Flies per Standard Holding Cage 20" Long and 12" in Diameter

Duplicate cages were set up containing approximately 250, 500, 750, 1,000, and 1,500 flies of both sexes held at room temperature. At nine days the entire stock of flies from each cage was egged and the egg masses were weighed to determine the oviposition rate per female, based on the original number of flies (10 mg. equal 200 eggs or 1 mass). At the 250 and 500 holding rate the oviposition rate ranged from 0.81 to

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0.99 masses per female. At the 750 holding rate the oviposition rate ranged from 0.55 to 0.70 compared to a range of 0.46 to 0.63 for the 1,000 holding rate. The 1,500 holding rate compared favorably to both the 750 and 1,000 holding rate, ranging from 0.48 to 0.65 egg masses per female.

Mortality ranged from a low of 2.4% in one of the 250 holding-rate cages to a high of 33.3% in a cage containing 1,000 flies.

D. Mating Test

Virgin males from one through five days old were caged with virgin five-day-old females and the rate of mating for the first thirty minutes was as follows:

1-day-old males - none

2-day-old males - 14%

3-day-old males - 62%

4-day-old males - 50%

5-day-old males - 60%

II. Chemical Studies

Through the generous cooperation of the Biological Section, Chemical Corps, Fort Detrick, Maryland, who "loaned" Mr. W. E. Gray to us for six weeks, the essential deodorizing and other air-conditioning equipment has been installed. Of necessity, some adjustments of the equipment may have to be made as production is increased, but thus far the equipment has performed satisfactorily.

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III. Attractants

Three baits are being tested in square fly traps 10 feet apart at Christmas, Fla. The composition of the baits were:

- Trap 1. 2 lbs. liver + sufficient tap water to fill pan but not to completely cover liver.
- Trap 2. 200 g. ground horse meat, 100 cc. citrated blood, 200 cc. tap water
- Trap 3. 200 cc. egg yolk (5% with distilled water); incubated 2 days at 37° C.
100 cc. citrated blood
200 g. ground horse meat.

Four round traps (duplicates of 2 baits) were set up along the Bithlo Cutoff, the first being 4 1/2 miles from the Bithlo laboratory, and each set separated by two miles; each material in a set was separated by one mile.

Trap 4 Same as trap 3)
Trap 5 " " " 1) Set

Trap 6 Same as trap 3)
Trap 7 " " " 1) Set

It is to be noted that the liver was fresh liver just defrosted. Also trap 6 bait was completely devoured by an animal, between the first and second day of testing. The egg-yolk materials were practically completely spent by the fifth day. Traps 1, 2, and 3 were set up in a pasture where there were screw-worm infestations. Sarcophagidae infested the bait in every trap.

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- Trap 2. 200 g. ground horse meat, 100 cc. citrated blood, 200 cc. tap water
- Trap 3. 200 cc. egg yolk (2% with distilled water); incubated 2 days at 37° C. 100 cc. citrated blood 200 g. ground horse meat.

Four round traps (duplicates of 2 baits) were set up along the Bithlo Cut-off, the first being 1 1/2 miles from the Bithlo Laboratory, and each set separated by two miles; each material in a set was separated by one mile.

Trap 4 Same as trap 3)
Set {
Trap 5 " " " 1)

Trap 6 Same as trap 3)
Set {
Trap 7 " " " 1)

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Results: Fly catch during test period; test started June 20.

Trap:	June 21			June 22			June 23-25			Total		
	Screw-worm: Catch:			Screw-worm: Catch:			Screw-worm: Catch:			Screw-worm: Catch:		
	M. : F. :in cc.:			M. : F. :in cc.:			M. : F. :in cc.:			M. : F. :in cc.:		
1	0	0	5	0	0	4	0	1	110	0	1	119
2	0	0	5	0	0	15	0	2	250	0	2	270
3	0	2	225	0	0	65	0	2	490	0	2	580
4	0	0	20	0	1	90	0	20	400	0	23	510
5	0	0	5	0	0	25	0	15	310	0	15	340
6	0	0	5	0	2	30	--	--	--	0 _a /	2 _a /	35 _a /
7	0	1	3	0	1	15	0	11	125	0	13	143

a/ Less than 2 days

Results: Fly catch during test period; test started June 20.

Trap:	M. : F. : in cc.:	June 21 :	June 22 :	June 23-25 :	Total :
1	0 0 0	5 0 0	14 0 0	110 1 0	119 1 0
2	0 0 0	5 0 0	15 0 0	250 2 0	270 2 0
3	0 0 0	25 0 0	65 0 0	190 2 0	280 2 0
4	0 0 0	20 0 0	20 1 0	100 20 0	210 23 0
5	0 0 0	5 0 0	25 0 0	310 15 0	340 15 0
6	0 0 0	5 0 0	30 2 0	-- -- --	359 28 0
7	0 1 3	1 1 5	0 1 5	125 11 0	143 13 0

a/ Less than 2 days